

along the waveguide axis;

wherein each of the first and second gaps has a gap width that allows propagation along the waveguide axis of electromagnetic waves in a TE $n,0$ mode, wherein n is an odd number, but suppresses electromagnetic waves in a TE $m,0$ mode, wherein m is an even number;

at least one transmitter connected to the waveguide for sending an electrical signal along the waveguide; and

at least one receiver connected to the waveguide for accepting the electrical signal.--

REMARKS

The disclosure is objected to because the examiner states that on page 12, lines 5, 8, 12, and 18, "channel" should follow each occurrence of "dielectric". Applicant respectfully points out that an amendment to the specification as suggested by the examiner was submitted in the previous response filed on August 16, 2002. Thus, withdrawal of the objection is earnestly solicited.

Claims 1, 5, 17, 19, 20, 21, 23, and 28 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Barnett et al. (U.S. Pat. No. 5,929,728) and the Butterweck paper taken in combination. Claims 3 and 4 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the rejection as applied to claim 1, and further in view of Ishikawa et al.

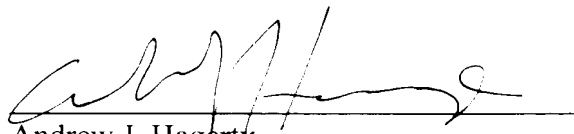
Notwithstanding the rejections of record, the examiner indicates claims 2, 16, 18, 22, and 24-27 contain patentable subject matter, and would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Thus, Applicant has amended claim 1 by incorporating the feature of original claim 2, and accordingly canceled claim 2. New claim 29 represents claim 16 written in independent form and including the features of base claim 1. New claim 30 represents claims 18 and 22 written in independent form and including the features of base claim 1 and intervening claim 17. Lastly, new claim 31 represents claim 24 written in independent form and including the features of base claim 1 and intervening claim 17. Thus, all of the pending claims 1, 3-5, and 16-31 are in condition for allowance.

Conclusion:

The foregoing represents a complete response to the Office Action, and Applicant submits that the claims in their present form are in condition for allowance. Early and favorable consideration is earnestly solicited.

Attached hereto is a marked-up version of the changes made to the application by the current amendment. The attached page is captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE.**"

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

Claim 2 has been canceled.

Claim 1 has been amended as follows:

1. (Twice Amended) A backplane system, comprising:
 - a substrate comprising a multilayer board;
 - a waveguide connected to the substrate, the waveguide having a gap therein for preventing propagation of a lower order mode into a higher order mode;
 - at least one transmitter connected to the waveguide for sending an electrical signal along the waveguide; and
 - at least one receiver connected to the waveguide for accepting the electrical signal.

The following new claims have been added:

29. (New) A backplane system, comprising:
 - a substrate;
 - a non-radiative dielectric waveguide connected to the substrate, the waveguide having a gap therein for preventing propagation of a lower order mode into a higher order mode;
 - at least one transmitter connected to the waveguide for sending an electrical signal along the waveguide; and
 - at least one receiver connected to the waveguide for accepting the electrical signal.
30. (New) A backplane system, comprising:
 - a substrate;
 - a waveguide connected to the substrate, the waveguide including:
 - a first conductive channel disposed along a waveguide axis;
 - a second conductive channel disposed generally parallel to and spaced from the first channel to thereby define a gap between the first and second channels along the waveguide axis, the gap has a width that allows propagation along the waveguide axis of

electromagnetic waves in a TE $n,0$ mode, wherein n is an odd number, but suppresses electromagnetic waves in a TE $m,0$ mode, wherein m is an even number;

wherein one of the first conductive channel and the second conductive channel has a generally I-shaped cross section along the waveguide axis.

31. (New) A backplane system, comprising:

a substrate;

a waveguide connected to the substrate, the waveguide including:

a first conductive channel disposed along a waveguide axis;

a second conductive channel disposed generally parallel to and spaced from the first channel to thereby define a first gap between the first and second channels along the waveguide axis;

a third conductive channel disposed generally parallel to and spaced apart from the first channel to thereby define a second gap between the first and third channels along the waveguide axis;

wherein each of the first and second gaps has a gap width that allows propagation along the waveguide axis of electromagnetic waves in a TE $n,0$ mode, wherein n is an odd number, but suppresses electromagnetic waves in a TE $m,0$ mode, wherein m is an even number;

at least one transmitter connected to the waveguide for sending an electrical signal along the waveguide; and

at least one receiver connected to the waveguide for accepting the electrical signal.